#2

SEQUENCE LISTING

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<110>  AZPIROZ, Ricardo
       CHOE, Sunghwa
       FELDMANN, Kenneth

<120>  DWF4 POLYNUCLEOTIDES, POLYPEPTIDES AND USES THEREOF

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<140>  09/502,426
<141>  2000-02-11

<150>  60/119,657
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Arg Lys Thr Arg Phe Asn Leu Pro Pro Gly Lys Ser Gly Trp Pro Phe
        35                  40                  45

Leu Gly Glu Thr Ile Gly Tyr Leu Lys Pro Tyr Thr Ala Thr Thr Leu
    50                  55                  60

Gly Asp Phe Met Gln Gln His Val Ser Lys Tyr Gly Lys Ile Tyr Arg
65                  70                  75                  80

Ser Asn Leu Phe Gly Glu Pro Thr Ile Val Ser Ala Asp Ala Gly Leu
                85                  90                  95

Asn Arg Phe Ile Leu Gln Asn Glu Gly Arg Leu Phe Glu Cys Ser Tyr
            100                 105                 110
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Ser His Ala Arg Leu Arg Thr Ile Leu Leu Lys Asp Val Glu Arg His
145   150   155   160

Thr Leu Phe Val Leu Asp Ser Trp Gln Gln Asn Ser Ile Phe Ser Ala
          165   170   175

Gln Asp Glu Ala Lys Lys Phe Thr Phe Asn Leu Met Ala Lys His Ile
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Met Ser Met Asp Pro Gly Glu Glu Glu Thr Glu Gln Leu Lys Lys Glu
      195   200   205

Tyr Val Thr Phe Met Lys Gly Val Val Ser Ala Pro Leu Asn Leu Pro
    210   215   220

Gly Thr Ala Tyr His Lys Ala Leu Gln Ser Arg Ala Thr Ile Leu Lys
225   230   235   240

Phe Ile Glu Arg Lys Met Glu Glu Arg Lys Leu Asp Ile Lys Glu Glu
        245   250   255

Asp Gln Glu Glu Glu Glu Val Lys Thr Glu Asp Glu Ala Glu Met Ser
        260   265   270

Lys Ser Asp His Val Arg Lys Gln Arg Thr Asp Asp Asp Leu Leu Gly
      275   280   285

Trp Val Leu Lys His Ser Asn Leu Ser Thr Glu Gln Ile Leu Asp Leu
    290   295   300

Ile Leu Ser Leu Leu Phe Ala Gly His Glu Thr Ser Ser Val Ala Ile
305   310   315   320

Ala Leu Ala Ile Phe Phe Leu Gln Ala Cys Pro Lys Ala Val Glu Glu
        325   330   335

Leu Arg Glu Glu His Leu Glu Ile Ala Arg Ala Lys Lys Glu Leu Gly
        340   345   350

Glu Ser Glu Leu Asn Trp Asp Asp Tyr Lys Lys Met Asp Phe Thr Gln
      355   360   365

Cys Val Ile Asn Glu Thr Leu Arg Leu Gly Asn Val Val Arg Phe Leu
    370   375   380

His Arg Lys Ala Leu Lys Asp Val Arg Tyr Lys Gly Tyr Asp Ile Pro
385   390   395   400

Ser Gly Trp Lys Val Leu Pro Val Ile Ser Ala Val His Leu Asp Asn
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Gln Asn Asn Gly Ala Ser Ser Ser Gly Ser Gly Ser Phe Ser Thr Trp
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Gly Asn Asn Tyr Met Pro Phe Gly Gly Gly Pro Arg Leu Cys Ala Gly
    450             455             460

Ser Glu Leu Ala Lys Leu Glu Met Ala Val Phe Ile His His Leu Val
465             470             475             480

Leu Lys Phe Asn Trp Glu Leu Ala Glu Asp Asp Gln Pro Phe Ala Phe
            485             490             495

Pro Phe Val Asp Phe Pro Asn Gly Leu Pro Ile Arg Val Ser Arg Ile
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Leu
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<210> 5
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<210> 6
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<212> DNA
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<210> 7
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<210> 8
<211> 21
<212> DNA
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<210> 9
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<210> 10
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<210> 11
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<210> 12
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<210> 13
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<210> 14
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<210> 15
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<210> 16
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<210> 17
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<220>
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<400> 17
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<210> 18
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<223> Description of Artificial Sequence: primer
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<212> PRT
<213> Arabidopsis thaliana

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            20   25   30
Pro Gly Ser Leu Gly Leu Pro Leu Ile Gly Glu Thr Phe Gln Leu Ile
            35   40   45
Gly Ala Tyr Lys Thr Glu Asn Pro Glu Pro Phe Ile Asp Glu Arg Val
        50   55   60
Ala Arg Tyr Gly Ser Val Phe Met Thr His Leu Phe Gly Glu Pro Thr
65   70   75   80
Ile Phe Ser Ala Asp Pro Glu Thr Asn Arg Phe Val Leu Gln Asn Glu
                85   90   95
Gly Lys Leu Phe Glu Cys Ser Tyr Pro Ala Ser Ile Cys Asn Leu Leu
                100   105   110
Gly Lys His Ser Leu Leu Leu Met Lys Gly Ser Leu His Lys Arg Met
            115   120   125
His Ser Leu Thr Met Ser Phe Ala Asn Ser Ser Ile Ile Lys Asp His
        130   135   140
Leu Met Leu Asp Ile Asp Arg Leu Val Arg Phe Asn Leu Asp Ser Trp
145   150   155   160
Ser Ser Arg Val Leu Leu Met Glu Glu Ala Lys Lys Ile Thr Phe Glu
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Leu Thr Val Lys Gln Leu Met Ser Phe Asp Pro Gly Glu Trp Ser Glu

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 Ser Leu Arg Lys Glu Tyr Leu Leu Val Ile Glu Gly Phe Phe Ser Leu
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         210                        215                        220
 Arg Lys Val Ala Glu Ala Leu Thr Val Val Val Met Lys Arg Arg Glu
 225                        230                        235                        240
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                 275                        280                        285
 Leu Ala Val Lys Phe Leu Thr Glu Thr Pro Leu Ala Leu Ala Gln Leu
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 Ala Met Thr Asp Val Glu Ile Lys Gly Tyr Lys Ile Pro Lys Gly Trp
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 His Arg Leu Val Thr Gly Phe Ser Trp Val Pro Ala Glu Gln Asp Lys
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<211> 464
<212> PRT
<213> Lycopersicon esculentum

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 Asn Leu Pro Pro Gly Thr Met Gly Trp Pro Leu Phe Gly Glu Thr Thr
                 35                        40                        45
 Glu Phe Leu Lys Leu Gly Pro Ser Phe Met Lys Asn Gln Arg Ala Arg
         50                        55                        60
 Tyr Gly Ser Phe Phe Lys Ser His Ile Leu Gly Cys Pro Thr Ile Val
 65                        70                        75                        80
 Ser Met Asp Ser Glu Leu Asn Arg Tyr Ile Leu Val Asn Glu Ala Lys
                 85                        90                        95
 Gly Leu Val Pro Gly Tyr Pro Gln Ser Met Ile Asp Ile Leu Gly Lys
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 Pro Lys Ile Asp Glu Phe Met Arg Ser His Leu Thr Asn Trp Asp Asn
 145                       150                       155                       160
 Lys Val Ile Asp Ile Gln Glu Lys Thr Asn Lys Met Ala Phe Leu Ser
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 Ser Leu Lys Gln Ile Ala Gly Ile Glu Ser Thr Ser Leu Ala Gln Glu
                 180                       185                       190
 Phe Met Ser Glu Phe Phe Asn Leu Val Leu Gly Thr Leu Ser Leu Pro
         195                       200                       205
 Ile Asn Leu Pro Asn Thr Asn Tyr His Arg Gly Phe Gln Ala Arg Lys
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 Ile Ile Val Asn Leu Leu Arg Thr Leu Ile Glu Glu Arg Arg Ala Ser
 225                       230                       235                       240
 Lys Glu Ile Gln His Asp Met Leu Gly Tyr Leu Met Asn Glu Glu Ala
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 Thr Arg Phe Lys Leu Thr Asp Asp Glu Met Ile Asp Leu Ile Ile Thr
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 Ile Leu Tyr Ser Gly Tyr Glu Thr Val Ser Thr Thr Ser Met Met Ala
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 Val Lys Tyr Leu His Asp His Pro Lys Val Leu Glu Glu Leu Arg Lys
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 Glu His Met Ala Ile Arg Glu Lys Lys Lys Pro Glu Asp Pro Ile Asp
 305                       310                       315                       320
 Tyr Asn Asp Tyr Arg Ser Met Arg Phe Thr Arg Ala Val Ile Leu Glu
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 Thr Ser Arg Leu Ala Thr Ile Val Asn Gly Val Leu Arg Lys Thr Thr
                 340                       345                       350
 Gln Asp Met Glu Ile Asn Gly Tyr Ile Ile Pro Lys Gly Trp Arg Ile
                 355                       360                       365
 Tyr Val Tyr Thr Arg Glu Leu Asn Tyr Asp Pro Arg Leu Tyr Pro Asp
     370                       375                       380
 Pro Tyr Ser Phe Asn Pro Trp Arg Trp Met Asp Lys Ser Leu Glu His
 385                       390                       395                       400
 Gln Asn Ser Phe Leu Val Phe Gly Gly Gly Thr Arg Gln Cys Pro Gly
                 405                       410                       415
 Lys Glu Leu Gly Val Ala Glu Ile Ser Thr Phe Leu His Tyr Phe Val
                 420                       425                       430
 Thr Lys Tyr Arg Trp Glu Glu Ile Gly Gly Asp Lys Leu Met Lys Phe
         435                       440                       445
 Pro Arg Val Glu Ala Pro Asn Gly Leu Arg Ile Arg Val Ser Ala His
     450                       455                       460
```

```
<210> 21
<211> 444
<212> PRT
<213> Synechocystis sp.

<400> 21
 Met Ile Thr Ser Pro Thr Asn Leu Asn Ser Leu Pro Ile Pro Pro Gly
 1               5                       10                      15
 Asp Phe Gly Leu Pro Trp Leu Gly Glu Thr Leu Asn Phe Leu Asn Asp
                 20                      25                      30
 Gly Asp Phe Gly Lys Lys Arg Gln Gln Gln Phe Gly Pro Ile Phe Lys
```

```
               35                      40                      45
Thr Arg Leu Phe Gly Lys Asn Val Ile Phe Ile Ser Gly Ala Leu Ala
       50                      55                      60
Asn Arg Phe Leu Phe Thr Lys Glu Gln Glu Thr Phe Gln Ala Thr Trp
65                      70                      75                      80
Pro Leu Ser Thr Arg Ile Leu Leu Gly Pro Asn Ala Leu Ala Thr Gln
               85                      90                      95
Met Gly Glu Ile His Arg Ser Arg Arg Lys Ile Leu Tyr Gln Ala Phe
               100                     105                     110
Leu Pro Arg Thr Leu Asp Ser Tyr Leu Pro Lys Met Asp Gly Ile Val
       115                     120                     125
Gln Gly Tyr Leu Glu Gln Trp Gly Lys Ala Asn Glu Val Ile Trp Tyr
       130                     135                     140
Pro Gln Leu Arg Arg Met Thr Phe Asp Val Ala Ala Thr Leu Phe Met
145                     150                     155                     160
Gly Glu Lys Val Ser Gln Asn Pro Gln Leu Phe Pro Trp Phe Glu Thr
               165                     170                     175
Tyr Ile Gln Gly Leu Phe Ser Leu Pro Ile Pro Leu Pro Asn Thr Leu
               180                     185                     190
Phe Gly Lys Ser Gln Arg Ala Arg Ala Leu Leu Leu Ala Glu Leu Glu
       195                     200                     205
Lys Ile Ile Lys Ala Arg Gln Gln Gln Pro Pro Ser Glu Glu Asp Ala
       210                     215                     220
Leu Gly Ile Leu Leu Ala Ala Arg Asp Asp Asn Asn Gln Pro Leu Ser
225                     230                     235                     240
Leu Pro Glu Leu Lys Asp Gln Ile Leu Leu Leu Leu Phe Ala Gly His
               245                     250                     255
Glu Thr Leu Thr Ser Ala Leu Ser Ser Phe Cys Leu Leu Leu Gly Gln
               260                     265                     270
His Ser Asp Ile Arg Glu Arg Val Arg Gln Glu Gln Asn Lys Leu Gln
       275                     280                     285
Leu Ser Gln Glu Leu Thr Ala Glu Thr Leu Lys Lys Met Pro Tyr Leu
       290                     295                     300
Asp Gln Val Leu Gln Glu Val Leu Arg Leu Ile Pro Pro Val Gly Gly
305                     310                     315                     320
Gly Phe Arg Glu Leu Ile Gln Asp Cys Gln Phe Gln Gly Phe His Phe
               325                     330                     335
Pro Lys Gly Trp Leu Val Ser Tyr Gln Ile Ser Gln Thr His Ala Asp
               340                     345                     350
Pro Asp Leu Tyr Pro Asp Pro Glu Lys Phe Asp Pro Glu Arg Phe Thr
       355                     360                     365
Pro Asp Gly Ser Ala Thr His Asn Pro Pro Phe Ala His Val Pro Phe
       370                     375                     380
Gly Gly Gly Leu Arg Glu Cys Leu Gly Lys Glu Phe Ala Arg Leu Glu
385                     390                     395                     400
Met Lys Leu Phe Ala Thr Arg Leu Ile Gln Gln Phe Asp Trp Thr Leu
               405                     410                     415
Leu Pro Gly Gln Asn Leu Glu Leu Val Val Thr Pro Ser Pro Arg Pro
               420                     425                     430
Lys Asp Asn Leu Arg Val Lys Leu His Ser Leu Met
       435                     440
```

<210> 22
<211> 519
<212> PRT
<213> Zea mays

<400> 22

```
Met Leu Gly Val Gly Met Ala Ala Ala Val Leu Leu Gly Ala Val Ala
 1               5                   10                  15
Leu Leu Leu Ala Asp Ala Ala Ala Arg Arg Ala His Trp Trp Tyr Arg
            20                  25                  30
Glu Ala Ala Glu Ala Val Leu Val Gly Ala Val Ala Leu Val Val Val
            35                  40                  45
Asp Ala Ala Ala Arg Arg Ala His Gly Trp Tyr Arg Glu Ala Ala Leu
    50                  55                  60
Gly Ala Ala Arg Arg Ala Arg Leu Pro Pro Gly Glu Met Gly Trp Pro
65                  70                  75                  80
Leu Val Gly Gly Met Trp Ala Phe Leu Arg Ala Phe Lys Ser Gly Lys
                85                  90                  95
Pro Asp Ala Phe Ile Ala Ser Phe Val Arg Arg Phe Gly Arg Thr Gly
            100                 105                 110
Val Tyr Arg Ser Phe Met Phe Ser Ser Pro Thr Val Leu Val Thr Thr
    115                 120                 125
Ala Glu Gly Cys Lys Gln Val Leu Met Asp Asp Asp Ala Phe Val Thr
    130                 135                 140
Gly Trp Pro Lys Ala Thr Val Ala Leu Val Gly Pro Arg Ser Phe Val
145                 150                 155                 160
Ala Met Pro Tyr Asp Glu His Arg Arg Ile Arg Lys Leu Thr Ala Ala
            165                 170                 175
Pro Ile Asn Gly Phe Asp Ala Leu Thr Gly Tyr Leu Pro Phe Ile Asp
            180                 185                 190
Arg Thr Val Thr Ser Ser Leu Arg Ala Trp Ala Asp His Gly Gly Ser
    195                 200                 205
Val Glu Phe Leu Thr Glu Leu Arg Arg Met Thr Phe Lys Ile Ile Val
    210                 215                 220
Gln Ile Phe Leu Gly Gly Ala Asp Gln Ala Thr Thr Arg Ala Leu Glu
225                 230                 235                 240
Arg Ser Tyr Thr Glu Leu Asn Tyr Gly Met Arg Ala Met Ala Ile Asn
            245                 250                 255
Leu Pro Gly Phe Ala Tyr Arg Gly Ala Leu Arg Ala Arg Arg Arg Leu
            260                 265                 270
Val Ala Val Leu Gln Gly Val Leu Asp Glu Arg Arg Ala Ala Arg Ala
    275                 280                 285
Lys Gly Val Ser Gly Gly Gly Val Asp Met Met Asp Arg Leu Ile Glu
    290                 295                 300
Ala Gln Asp Glu Arg Gly Arg His Leu Asp Asp Asp Glu Ile Ile Asp
305                 310                 315                 320
Val Leu Val Met Tyr Leu Asn Ala Gly His Glu Ser Ser Gly His Ile
            325                 330                 335
Thr Met Trp Ala Thr Val Phe Leu Gln Glu Asn Pro Asp Met Phe Ala
            340                 345                 350
Arg Ala Lys Ala Glu Gln Glu Ala Ile Met Arg Ser Ile Pro Ser Ser
            355                 360                 365
Gln Arg Gly Leu Thr Leu Arg Asp Phe Arg Lys Met Glu Tyr Leu Ser
    370                 375                 380
Gln Val Ile Asp Glu Thr Leu Arg Leu Val Asn Ile Ser Phe Val Ser
385                 390                 395                 400
Phe Arg Gln Ala Thr Arg Asp Val Phe Val Asn Gly Tyr Leu Ile Pro
            405                 410                 415
Lys Gly Trp Lys Val Gln Leu Trp Tyr Arg Ser Val His Met Asp Pro
            420                 425                 430
Gln Val Tyr Pro Asp Pro Thr Lys Phe Asp Pro Ser Arg Trp Glu Gly
            435                 440                 445
```

```
His Ser Pro Arg Ala Gly Thr Phe Leu Ala Phe Gly Leu Gly Ala Arg
    450                 455                 460
Leu Cys Pro Gly Asn Asp Leu Ala Lys Leu Glu Ile Ser Val Phe Leu
465                 470                 475                 480
His His Phe Leu Leu Gly Tyr Lys Leu Ala Arg Thr Asn Pro Arg Cys
                485                 490                 495
Arg Val Arg Tyr Leu Pro His Pro Arg Pro Val Asp Asn Cys Leu Ala
                500                 505                 510
Lys Ile Thr Arg Val Gly Ser
            515
```

<210> 23
<211> 492
<212> PRT
<213> Danio rerio

<400> 23
```
Met Gly Leu Tyr Thr Leu Met Val Thr Phe Leu Cys Thr Ile Val Leu
  1                 5                 10                  15
Pro Val Leu Leu Phe Leu Ala Ala Val Lys Leu Trp Glu Met Leu Met
                20                  25                  30
Ile Arg Arg Val Asp Pro Asn Cys Arg Ser Pro Leu Pro Pro Gly Thr
            35                  40                  45
Met Gly Leu Pro Phe Ile Gly Glu Thr Leu Gln Leu Ile Leu Gln Arg
        50                  55                  60
Arg Lys Phe Leu Arg Met Lys Arg Gln Lys Tyr Gly Cys Ile Tyr Lys
65                  70                  75                  80
Thr His Leu Phe Gly Asn Pro Thr Val Arg Val Met Gly Ala Asp Asn
                85                  90                  95
Val Arg Gln Ile Leu Leu Gly Glu His Lys Leu Val Ser Val Gln Trp
                100                 105                 110
Pro Ala Ser Val Arg Thr Ile Leu Gly Ser Asp Thr Leu Ser Asn Val
            115                 120                 125
His Gly Val Gln His Lys Asn Lys Lys Lys Ala Ile Met Arg Ala Phe
        130                 135                 140
Ser Arg Asp Ala Leu Glu His Tyr Ile Pro Val Ile Gln Gln Glu Val
145                 150                 155                 160
Lys Ser Ala Ile Gln Glu Trp Leu Gln Lys Asp Ser Cys Val Leu Val
                165                 170                 175
Tyr Pro Glu Met Lys Lys Leu Met Phe Arg Ile Ala Met Arg Ile Leu
                180                 185                 190
Leu Gly Phe Glu Pro Glu Gln Ile Lys Thr Asp Glu Gln Glu Leu Val
            195                 200                 205
Glu Ala Phe Glu Glu Met Ile Lys Asn Leu Phe Ser Leu Pro Ile Asp
        210                 215                 220
Val Pro Phe Ser Gly Leu Tyr Arg Gly Leu Arg Ala Arg Asn Phe Ile
225                 230                 235                 240
His Ser Lys Ile Glu Glu Asn Ile Arg Lys Lys Ile Gln Asp Asp Asp
                245                 250                 255
Asn Glu Asn Glu Gln Lys Tyr Lys Asp Ala Leu Gln Leu Leu Ile Glu
                260                 265                 270
Asn Ser Arg Arg Ser Asp Glu Pro Phe Ser Leu Gln Ala Met Lys Glu
            275                 280                 285
Ala Ala Thr Glu Leu Leu Phe Gly Gly His Glu Thr Thr Ala Ser Thr
        290                 295                 300
Ala Thr Ser Leu Val Met Phe Leu Gly Leu Asn Thr Glu Val Val Gln
305                 310                 315                 320
```

```
Lys Val Arg Glu Glu Val Gln Glu Lys Val Glu Met Gly Met Tyr Thr
            325                 330                 335
Pro Gly Lys Gly Leu Ser Met Glu Leu Leu Asp Gln Leu Lys Tyr Thr
            340                 345                 350
Gly Cys Val Ile Lys Glu Thr Leu Arg Ile Asn Pro Pro Val Pro Gly
            355                 360                 365
Gly Phe Arg Val Ala Leu Lys Thr Phe Glu Leu Asn Gly Tyr Gln Ile
        370                 375                 380
Pro Lys Gly Trp Asn Val Ile Tyr Ser Ile Cys Asp Thr His Asp Val
385                 390                 395                 400
Ala Asp Val Phe Pro Asn Lys Glu Glu Phe Gln Pro Glu Arg Phe Met
                405                 410                 415
Ser Lys Gly Leu Glu Asp Gly Ser Arg Phe Asn Tyr Ile Pro Phe Gly
            420                 425                 430
Gly Gly Ser Arg Met Cys Val Gly Lys Glu Phe Ala Lys Val Leu Leu
            435                 440                 445
Lys Ile Phe Leu Val Glu Leu Thr Gln His Cys Asn Trp Ile Leu Ser
            450                 455                 460
Asn Gly Pro Pro Thr Met Lys Thr Gly Pro Thr Ile Tyr Pro Val Asp
465                 470                 475                 480
Asn Leu Pro Thr Lys Phe Thr Ser Tyr Val Arg Asn
                485                 490

<210> 24
<211> 504
<212> PRT
<213> Homo sapiens

<400> 24
Met Ala Leu Ile Pro Asp Leu Ala Met Glu Thr Trp Leu Leu Leu Ala
 1               5                  10                  15
Val Ser Leu Val Leu Leu Tyr Leu Tyr Gly Thr His Ser His Gly Leu
            20                  25                  30
Phe Lys Lys Leu Gly Ile Pro Gly Pro Thr Pro Leu Pro Phe Leu Gly
        35                  40                  45
Asn Ile Leu Ser Tyr His Lys Gly Phe Cys Met Phe Asp Met Glu Cys
        50                  55                  60
His Lys Lys Tyr Gly Lys Val Trp Gly Phe Tyr Asp Gly Gln Gln Pro
65                  70                  75                  80
Val Leu Ala Ile Thr Asp Pro Asp Met Ile Lys Leu Val Leu Val Lys
                85                  90                  95
Glu Cys Tyr Ser Val Phe Thr Asn Arg Glu Pro Phe Gly Pro Val Gly
            100                 105                 110
Phe Met Lys Ser Ala Ile Ser Ile Ala Glu Asp Glu Glu Trp Lys Arg
        115                 120                 125
Leu Arg Ser Leu Leu Ser Pro Thr Phe Thr Ser Gly Lys Leu Lys Glu
        130                 135                 140
Met Val Pro Ile Ile Ala Gln Tyr Gly Asp Val Leu Val Arg Asn Leu
145                 150                 155                 160
Arg Arg Glu Arg Glu Thr Gly Lys Pro Val Thr Leu Lys Asp Val Phe
                165                 170                 175
Gly Ala Tyr Ser Met Asp Val Ile Thr Ser Ser Ser Phe Gly Val Asn
            180                 185                 190
Val Asp Ser Leu Asn Asn Pro Gln Asp Pro Leu Val Glu Asn Thr Lys
        195                 200                 205
Lys Leu Leu Arg Phe Asp Phe Leu Asp Pro Phe Phe Leu Ser Ile Thr
        210                 215                 220
```

```
Val Phe Pro Phe Leu Ile Pro Ile Leu Glu Val Leu Asn Ile Cys Val
225                 230             235                 240
Phe Pro Arg Glu Val Thr Asn Phe Leu Arg Lys Ala Val Lys Arg Met
            245             250                 255
Lys Glu Ser Arg Leu Glu Asp Thr Gln Lys His Arg Val Asp Phe Leu
            260             265                 270
Gln Leu Met Ile Asp Ser His Lys Asn Ser Lys Glu Thr Glu Ser His
            275             280                 285
Lys Ala Leu Ser Asp Leu Glu Leu Val Ala Gln Ser Ile Ile Phe Ile
    290             295                 300
Phe Ala Gly Tyr Glu Thr Thr Ser Ser Val Leu Ser Phe Ile Met Tyr
305             310             315                 320
Glu Leu Ala Thr His Pro Asp Val Gln Gln Lys Leu Gln Glu Glu Ile
            325             330                 335
Asp Ala Val Leu Pro Asn Lys Ala Pro Pro Thr Tyr Asp Thr Val Leu
            340             345                 350
Gln Met Glu Tyr Leu Asp Met Val Val Asn Glu Thr Leu Arg Leu Phe
            355             360                 365
Pro Ile Ala Met Arg Leu Glu Arg Val Cys Lys Lys Asp Val Glu Ile
            370             375             380
Asn Gly Met Phe Ile Pro Lys Gly Trp Val Val Met Ile Pro Ser Tyr
385             390             395                 400
Ala Leu His Arg Asp Pro Lys Tyr Trp Thr Glu Pro Glu Lys Phe Leu
            405             410                 415
Pro Glu Arg Phe Ser Lys Lys Asn Lys Asp Asn Ile Asp Pro Tyr Ile
            420             425                 430
Tyr Thr Pro Phe Gly Ser Gly Pro Arg Asn Cys Ile Gly Met Arg Phe
            435             440                 445
Ala Leu Met Asn Met Lys Leu Ala Leu Ile Arg Val Leu Gln Asn Phe
    450             455                 460
Ser Phe Lys Pro Cys Lys Glu Thr Gln Ile Pro Leu Lys Leu Ser Leu
465             470                 475                 480
Gly Gly Leu Leu Gln Pro Glu Lys Pro Val Val Leu Lys Val Glu Ser
            485             490                 495
Arg Asp Gly Thr Val Ser Gly Ala
            500
```

```
<210> 25
<211> 575
<212> PRT
<213> Artificial Sequence

<220>
<223> Consensus sequence

<221> VARIANT
<222> (1)...(575)
<223> Xaa = Any Amino Acid or No Amino Acid

<400> 25
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1               5                   10                  15
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            20                  25                  30
Xaa Xaa Xaa Xaa Xaa Xaa Leu Leu Ser Xaa Xaa Ala Leu Xaa Val Xaa
        35                  40                  45
Leu Xaa Leu Ala Ala Arg Arg Xaa Xaa Xaa Arg Tyr Xaa Xaa Xaa Xaa
```

```
                  50                        55                        60
Xaa Xaa Xaa Xaa Arg Arg Lys Xaa Leu Pro Pro Gly Thr Met Gly Leu
65                        70                        75                        80
Pro Xaa Leu Gly Glu Thr Leu Gln Phe Leu Lys Xaa Xaa Xaa Xaa Xaa
                        85                        90                        95
Xaa Pro Gly Asp Phe Xaa Lys Glu Arg Val Xaa Xaa Tyr Gly Xaa Xaa
                        100                       105                       110
Xaa Xaa Ile Tyr Lys His Leu Phe Gly Glu Pro Thr Ile Xaa Ser Xaa
                        115                       120                       125
Asp Ala Glu Leu Asn Arg Phe Xaa Leu Xaa Asn Glu Gly Xaa Lys Leu
              130                       135                       140
Phe Xaa Cys Xaa Xaa Pro Ala Ser Xaa Xaa Gly Xaa Leu Gly Lys Xaa
145                       150                       155                       160
Ser Leu Xaa Ala Xaa Xaa Gly Xaa Glu His Lys Arg Met Arg Xaa Leu
                        165                       170                       175
Leu Xaa Ser Xaa Phe Ser Xaa Xaa Xaa Xaa Leu Asp His Xaa Leu Pro
                        180                       185                       190
Xaa Ile Asp Arg Xaa Val Arg Ser Xaa Leu Xaa Xaa Trp Xaa Xaa Xaa
                        195                       200                       205
Xaa Gln Lys Xaa Xaa Ile Val Xaa Xaa Xaa Xaa Glu Xaa Lys Lys Met
                        210                       215                       220
Thr Phe Asp Xaa Xaa Xaa Lys Xaa Xaa Met Gly Xaa Xaa Pro Xaa Xaa
225                       230                       235                       240
Glu Xaa Thr Xaa Xaa Xaa Xaa Leu Val Xaa Glu Xaa Glu Xaa Leu Ile
                        245                       250                       255
Lys Gly Leu Phe Ser Leu Pro Ile Asn Leu Pro Xaa Thr Ala Tyr Xaa
                        260                       265                       270
Lys Ala Leu Xaa Ala Arg Ala Phe Xaa Xaa Ala Xaa Leu Glu Xaa Xaa
                        275                       280                       285
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ile Xaa Glu Xaa Arg Xaa Glu Glu
              290                       295                       300
Glu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
305                       310                       315                       320
Xaa Xaa Xaa Xaa Xaa Xaa Asp Asp Leu Leu Gly Leu Leu Xaa Ala Xaa
                        325                       330                       335
Xaa Xaa Xaa Xaa Xaa Glu Asp Glu Xaa Xaa Xaa Xaa Leu Ser Asp Xaa
              340                       345                       350
Glu Ile Xaa Asp Xaa Ile Xaa Xaa Leu Leu Phe Ala Gly His Glu Thr
              355                       360                       365
Thr Ser Ser Xaa Leu Xaa Xaa Ala Val Lys Phe Leu Xaa Glu His Pro
370                       375                       380
Asp Val Xaa Glu Xaa Leu Arg Glu Glu His Xaa Ala Ile Xaa Arg Ala
385                       390                       395                       400
Lys Lys Xaa Xaa Xaa Glu Ser Xaa Leu Thr Xaa Xaa Asp Tyr Lys Lys
                        405                       410                       415
Met Xaa Tyr Thr Xaa Cys Val Ile Asn Glu Thr Leu Arg Leu Ala Xaa
              420                       425                       430
Ile Val Gly Gly Xaa Phe Arg Xaa Ala Xaa Lys Asp Val Glu Ile Asn
              435                       440                       445
Gly Tyr Xaa Ile Pro Lys Gly Trp Lys Val Xaa Tyr Ser Ile Arg Ala
450                       455                       460
Val His Leu Asp Pro Asp Xaa Tyr Pro Asp Pro Glu Lys Phe Asn Pro
465                       470                       475                       480
Xaa Arg Trp Xaa Xaa Lys Xaa Xaa Xaa Xaa Ser Asn Ser Xaa Xaa Xaa
                        485                       490                       495
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn Xaa Xaa Pro Phe Gly Gly Gly Pro
              500                       505                       510
```

```
Arg Leu Cys Pro Gly Lys Glu Leu Ala Lys Leu Glu Met Xaa Val Phe
        515                 520                 525
Leu His Arg Leu Val Gln Xaa Phe Trp Glu Leu Ala Xaa Xaa Xaa Asp
    530                 535                 540
Xaa Xaa Xaa Lys Leu Val Xaa Phe Pro Thr Xaa Arg Pro Xaa Asp Asn
545             550                 555                 560
Leu Pro Ile Lys Val Xaa Xaa Arg Asp Xaa Xaa Xaa Xaa Xaa Xaa
            565                 570                 575
```